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# WILEY, REIN & FIELDING

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February 13, 1995



Mr. William F. Caton
Acting Secretary
Federal Communications Commission
Room 222 - Mail Stop 1170
1919 M St., N.W.
Washington, DC 20554



Re: **Ex Parte Presentations: Local Multipoint Distribution Service(LMDS), CC Docket No. 92-297; "Millimeter Wave Proceeding," ET Docket No. 94-124**

Dear Mr. Caton:

This is to note that on February 9, 1993, Tom Kilgo and Gene Robinson of Texas Instruments' Communications and Electronics Systems Division met with Ms. Susan Magnotti and Mr. Robert James of the Wireless Telecommunications Bureau to discuss the status of and TI's views in CC Docket No. 92-297 and ET Docket No. 94-124. Later on February 9, Messrs. Kilgo and Robinson along with Robert L. Pettit of this firm met with Ms. Karen Brinkmann of Chairman Hundt's office. With respect to use of spectrum above 40 GHz for LMDS, Messrs. Kilgo and Robinson urged the Commission to move forward with the LMDS allocation at 28 GHz. Copies of the materials provided during these meetings are attached along with two copies of a videotape discussing TI's efforts in the development of LMDS technology.

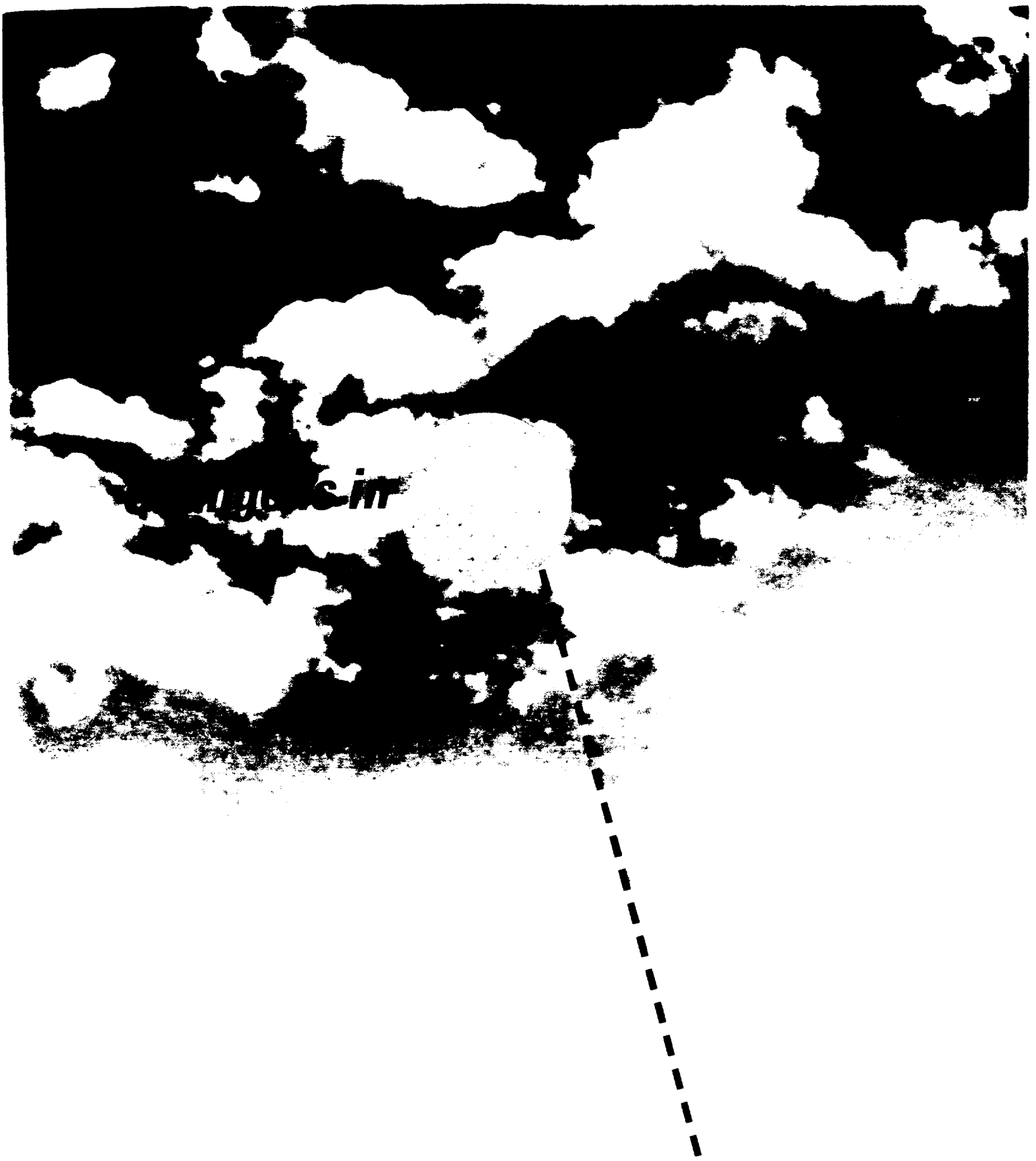
Should any questions arise concerning this matter, please contact me.

Respectfully,

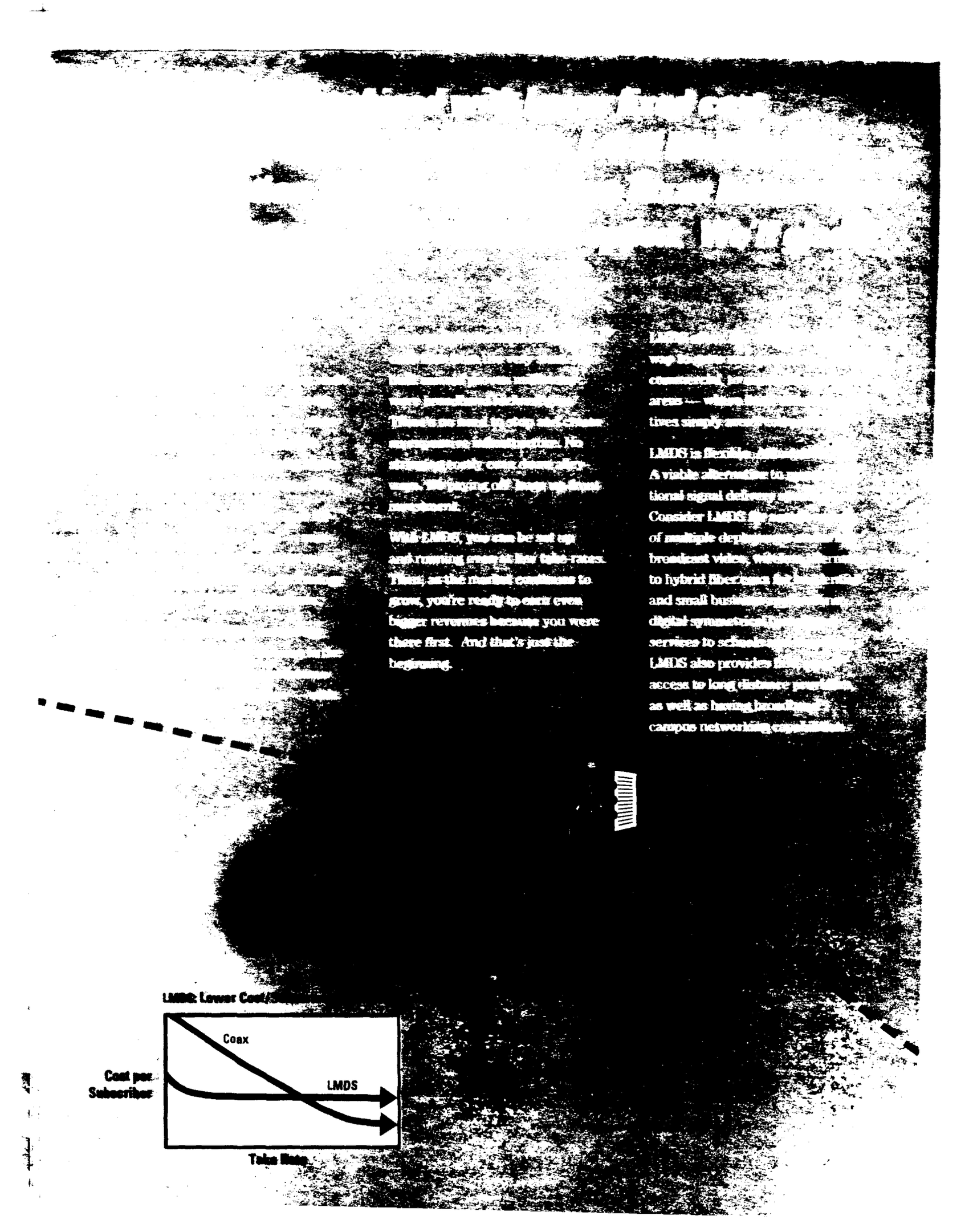
David E. Hilliard

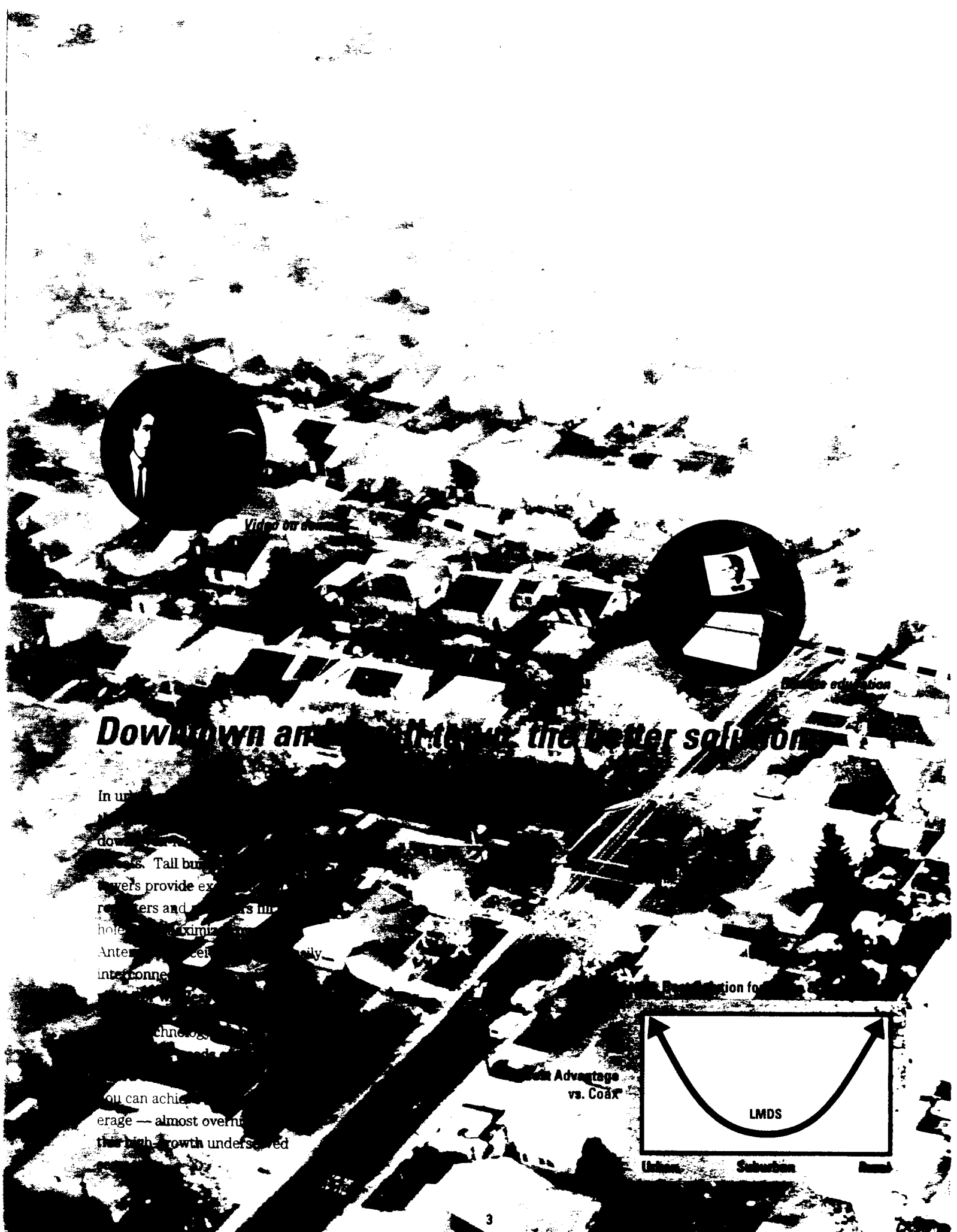
David E. Hilliard
Counsel for Texas Instruments

cc (w/o encl.): Karen Brinkmann, Esq.
Susan Magnotti, Esq.
Mr. Robert James



The best bottom line – 2-way digital LMDS from Texas Instruments – no strings attached.

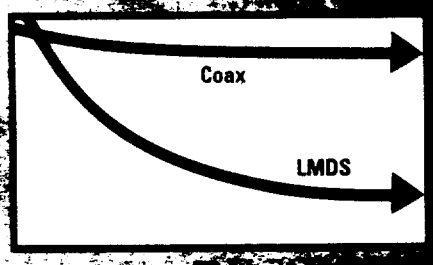

LMDS: Lower Cost/
Coax
LMDS
Cost per Subscriber
Take Rate

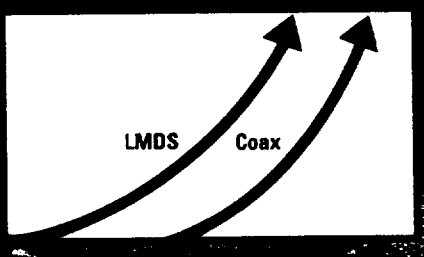

LMDS
Suburban

# ...in the details.

...down the road, [illegible] services can be deployed over a broadband digital infrastructure. You can move it, expand it, reconfigure it, tailor it to meet the needs of your ever-changing marketplace. Lower fixed costs make you less susceptible to market fluctuations, while helping you generate higher returns from the very start.

And it allows... cally visible at...



# Compare for yourself. Or let us help.

At a glance, LMDS delivers significant advantages over hybrid fiber coax systems currently available.

We'll gladly help you conduct an integrated field trial. Or we can help you analyze your business model. Best yet, we can support your team with the wealth of data we've collected in our own evaluations.

| | LMDS | Coax |
|---|---|---|
| [illegible] | ⊕ | ⊖ |
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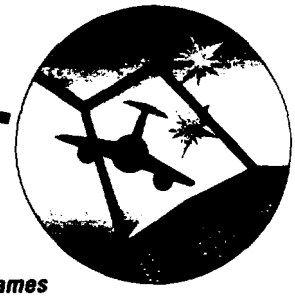
| [illegible] | ⊕ | ⊖ |
| Market Share | ⊕ | ⊖ |
| Flexibility | ⊕ | ⊖ |
| Out-Of-Region Capable | ⊕ | ⊖ |
| Rural Feasibility | ⊕ | ⊖ |
| Urban Feasibility | ⊕ | ⊖ |
| Maintenance Cost | ⊕ | ⊖ |
| | = Advantage: LMDS | |

*Video conferencing*



*Interactive video games*

# Why Texas Instruments?

We're building on our core competencies in systems design and integration — coupled with decades of experience in advanced millimeter wave technology and unequaled experience in designing and producing broadband systems — to help you get to market first with proven, revenue-generating technologies. Our LMDS solution can help put you in the lead on the Information Superhighway now, ahead of the competition.



Texas Instruments, headquartered in Dallas, Texas, is a leading developer and manufacturer of semiconductors, defense systems, software products, consumer products, electrical components and metallurgical materials. In addition to facilities across the continental United States, the company currently operates in more than 30 countries on five continents. TI's Defense Electronics Group won the Malcolm Baldrige Quality Award.

# Change is in the Air

*The market for video and interactive services is changing fast. TI technologies can get you there ahead of the wave.*

Texas Instruments

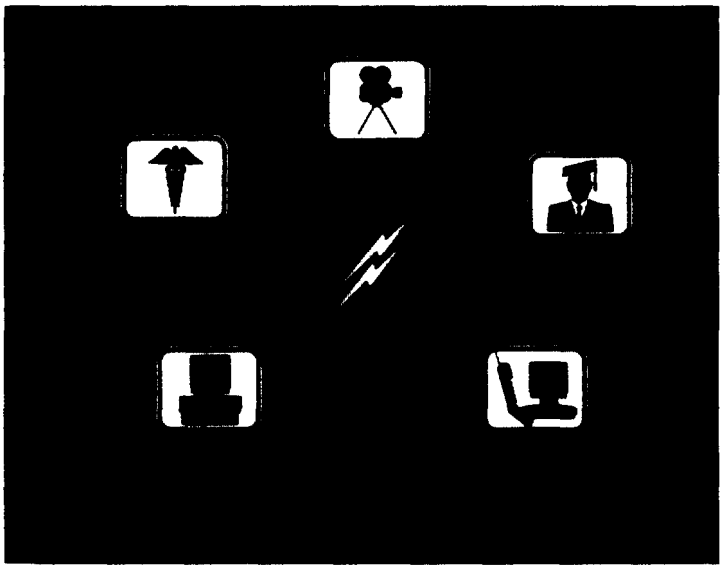
*Imagine the living room of the* ***not-too-distant future****. Two-way, multimedia, interactive video—all based on broadband interactive technologies—will drive the way consumers send, receive and use information. Videotelephones. Long-distance learning. Movies on demand. Telecommuting. Networked healthcare. And more.*

*Your task is to get to market* ***first*** *with the right solution.*

*Local Multipoint Distribution Services (LMDS) technology from Texas Instruments can make it all happen* ***faster****. With finely tuned broadband technologies that have the capability to do much more than coax cable, and combine the features of* ***low-cost system start-up*** *with lots of room to grow.*

## An alternative to hybrid fiber coax.

The Information Superhighway is just around the next bend—an era when massive amounts of information will travel to and from homes and businesses instantaneously. We've seen the rapid spread of cellular and wireless technologies. It points the way to the future—without the limitations of laying or hanging expensive cable. Texas Instruments has long been at the forefront of microwave and advanced antenna technologies. The capability exists now to couple our know-how with your needs for broadband interactive communications—often leveraging your existing tower and network assets—for a **fraction of the cost** of hybrid fiber coax.



*TI's interactive broadband LMDS provides Information Superhighway revenues. First.*

With TI, you can be in the wireless broadband business **fast**. And you can save money.

## Whoever gets there first with the most wins.

The technologies that will drive the Information Superhighway are rapidly taking shape. They will be flexible, expandable. And digital. Providers who get to market with proven broadband capabilities **first** can gain a leadership position quickly. Then defend it against new competitors.

The speed of deployment provided by LMDS can be the key to getting you set up and firmly established as a preferred provider of information to the home or office. In markets that are expected to expand tremendously over the next few years.

## Why Texas Instruments?

We're building on our core competencies in systems design and integration—coupled with decades of experience in advanced microwave technology and unequaled experience in designing and producing 28 GHz components—to enable you to get to market first with the most. Our LMDS solution can provide you with Information Superhighway revenues—first. Ahead of the competition.

We combine consumer know-how with technical competence, a vast global base of resources, and a focus on quality that recently earned our defense group the coveted Malcolm Baldrige National Quality Award.

Add to that our traditional strengths in complex systems integration—the capabilities behind LMDS systems—and we become the logical technology partner.

## Let's talk change.

Let us show you how LMDS technology from TI can get you to market with broadband communications capabilities in time for the coming change. For a lower cost than hybrid fiber coax.

**For more information, call or write to:**
**Texas Instruments**
**7839 Churchill Way, MS 3933**
**Dallas, Texas 75251**
**214-917-1528**

# TEXAS INSTRUMENTS'
# LMDS

- TI OVERVIEW
- LMDS VIEWS
- OPPORTUNITIES
- ACTIVITIES
- 28 GHZ VS 40 GHZ
- DISCUSSION

# TEXAS INSTRUMENTS
## OVERVIEW

- TI HAS FORMED A COMMUNICATION & ELECTRONIC SYSTEMS DIVISION TO ADDRESS EMERGING COMMUNICATIONS OPPORTUNITIES.

- THIS NEW DIVISION FORMS THE FOCUS BETWEEN THE TI CORPORATE BUSINESSES OF SEMICONDUCTORS, DEFENSE SYSTEMS AND INFORMATION SYSTEMS TO SUPPORT THE EMERGING BROADBAND COMMUNICATION TECHNOLOGIES.

- TI'S GAAS MICROWAVE DEVICE TECHNOLOGY AND SEMICONDUCTOR DIGITAL TECHNOLOGY DIRECTLY SUPPORTS THE WIRELESS REQUIREMENTS.

# TEXAS INSTRUMENTS'
# LMDS VIEW

- WIRELESS ALTERNATIVE TO BOTH COAX AND FIBER NETWORKS
  - LMDS WILL OFFER BROADBAND, DIGITAL, ONE- OR TWO-WAY SERVICE THAT WILL BE ECONOMICAL TO INSTALL AND OPERATE.

- LMDS SYSTEMS WILL BE BUILT AS STANDALONE NETWORKS OR MAKE USE OF INDIVIDUAL NODES INTEGRATED WITH COAX OR FIBER NETWORKS TO MAKE UP THE FUTURE BROADBAND, TWO-WAY DIGITAL NETWORKS

  - INITIAL LMDS APPLICATION WILL UTILIZE INDIVIDUAL 28 GHZ NODES AT THE CABLE OR FIBER END(S) TO EXPAND THE NETWORKS.

  - FUTURE SYSTEMS WILL MAKE USE OF OVERLAPPING 3 TO 5 KM CELLS TO PROVIDE WIDE AREA WIRELESS NETWORKS

# TEXAS INSTRUMENTS'
# LMDS VIEWS

- LMDS OFFERS AN ECONOMICAL BROADBAND DIGITAL DELIVERY SYSTEM FOR BOTH RURAL AND URBAN AREAS
  - SINGLE OR MULTIFAMILY
  - BUSINESS SERVICES
- DOMESTIC AND INTERNATIONAL OPPORTUNITIES

# TEXAS INSTRUMENTS'
# LMDS OPPORTUNITIES

- WIRELESS 28 GHZ NETWORK SYSTEMS WITH ONE OR MORE NODES AND MULTIPLE CPE'S FOR A COMPLETE NETWORK SOLUTION.

- POTENTIAL CUSTOMER BASE OF TELCO, CABLE, COMPETITIVE ACCESS PROVIDERS OR INDIVIDUAL WIRELESS SERVICE PROVIDERS TO

  - CONSUMERS; ONE- AND TWO-WAY VIDEO/DIGITAL DATA
  - BUSINESS' TWO-WAY VIDEO/DIGITAL DATA
  - EDUCATIONAL INSTITUTIONS; TWO-WAY VIDEO
  - MEDICAL PROVIDERS.

- BOTH DOMESTIC AND INTERNATIONAL OPPORTUNITIES FOR DIGITAL VIDEO & DATA

  - FIELD SURVEYS/DATA GATHERING
  - TRIAL SYSTEMS
  - INDIVIDUAL NODES WITH COAX/FIBER SYSTEMS
  - STANDALONE 28 GHZ WIRELESS NETWORKS

# TEXAS INSTRUMENTS
## LMDS ACTIVITIES

- FIELD DATA COLLECTION SYSTEMS (NODE AND CPE'S) DESIGNED AND DEVELOPED FOR ANALOG AND DIGITAL MODULATION FORMATS.
- DATA COLLECTION COMPLETED THROUGH FIELD TEST UNDER EXPERIMENTAL 28 GHZ LICENSES.
- NODE AND CPE SYSTEMS UNDER DEVELOPMENT AND BEING BUILT FOR USE IN 1995 FIELD TRIALS.
- PRODUCTION DESIGNS UNDERWAY TO SUPPORT 1995-96 MARKET OPPORTUNITIES.

# TEXAS INSTRUMENTS
## 28 GHZ VS 40 GHZ

- ONE TO TWO GHZ OF SPECTRUM IS CAPABLE OF SUPPORTING THE BROADBAND WIRELESS INFORMATION CHANNELS.

  - SYSTEMS ECONOMICS REQUIRE THE LOW COST AND HIGH RELIABILITY OFFERED BY SOLID-STATE MICROWAVE DEVICES
    VS
    THE HIGH COST, SHORT LIFE OF TWT TRANSMITTERS.

  - HOWEVER, EACH CHANNEL OF INFORMATION MUST BE SUPPORTED BY A SEPARATE SOLID-STATE TRANSMIT CHAIN WITH AN OUTPUT POWER CAPABLE OF SUPPORTING THE PATH LINK OVER A WIDE SECTOR COVERAGE.

- THE CURRENT DEVICE POWER CAPABILITY OF 1 WATT AT 28 GHZ ALLOWS AN ECONOMICAL, PRACTICAL SOLID-STATE SOLUTION TO BE APPLIED TO A MULTI-CHANNEL, MULTI-POINT BROADBAND WIRELESS SYSTEM.

- THE SAME CAPABILITY IS NOT AVAILABLE IN 40 GHZ DEVICES.

- INCREASED ANTENNA GAINS CANNOT RESOLVE THE 40 GHZ SHORTFALL IN MULTI-POINT DISTRIBUTION SYSTEMS.

# TEXAS INSTRUMENTS
## LMDS DISCUSSION

- U.S. VERSUS INTERNATIONAL DEVELOPMENTS
- INTERFERENCE/CO-EXISTANCE ISSUES WITH SATELLITES
- NOTICE OF PROPOSED RULE MAKING FOR 28 GHZ
- 28 GHZ EVENTS AND THEIR TIMETABLES
- SPECTRUM AUCTION POSSIBILITIES
- PUBLIC BENEFITS DERIVED FOR 28 GHZ
- POTENTIAL IMPACT OF 40 GHZ ON LMDS